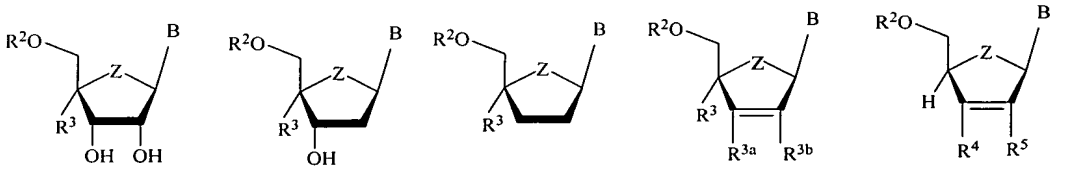
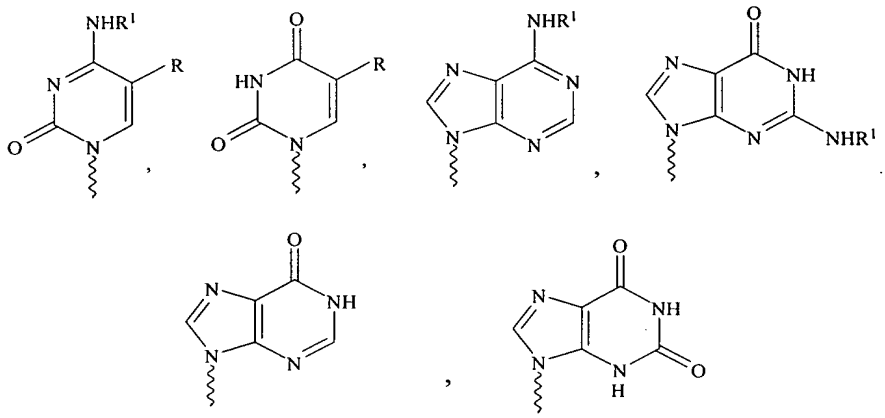
Claims:

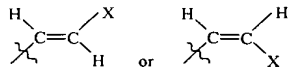
1. A compound according to the formula I, II, III, IV or V:



I **II** **III** **IV** **V**

wherein B is nucleoside base according to the structure:



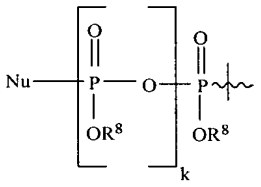
R is H, F, Cl, Br, I, C_1-C_4 alkyl, -C≡N, -C≡C-R_a,  ;

X is H, C_1-C_4 alkyl (preferably, CH_3), F, Cl, Br or I;

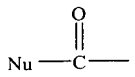
Z is O or CH_2, with the proviso that Z is CH_2 and not O when the compound is according to general formula II, R^3 is –C≡C-H and R^2 is H or a phosphate, diphosphate, triphosphate or phosphotriester group;

R^1 is H, an acyl group, a C_1—C_{20} alkyl or an ether group;

R^2 is H, an acyl group, a C_1—C_{20} alkyl or ether group, a phosphate, diphosphate, triphosphate, phosphodiester group or a



or



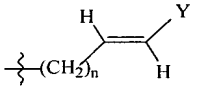
group;

Nu is a radical of a biologically active antiviral compound such that an amino group or hydroxyl group from said biologically active antiviral compound forms a phosphate, phosphoramidate, carbonate or urethane group with the adjacent moiety;

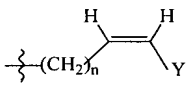
R^8 is a C_1-C_{20} alkyl or ether group;

k is 0-12, preferably, 0-2;

R^3 is selected from a C_1-C_4 alkyl (preferably, CH_3), $-(CH_2)_n$-C≡C-R_a,



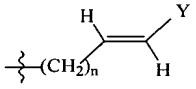
or



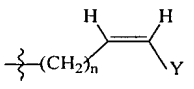
with the proviso that R^3 of compound formula II is not a -C≡C-H group when Z is O and R^2 is H, a phosphate, diphosphate, triphosphate or phosphodiester ;

R^{3a} and R^{3b} are independently selected from H, F, Cl, Br or I ;

R^4 and R^5 are independently selected from H, F, Cl, Br, I, OH, C_1-C_4 alkyl (preferably, CH_3), $-(CH_2)_n$-C≡C-R_a,



or



with the proviso that R^4 and R^5 are not both H;

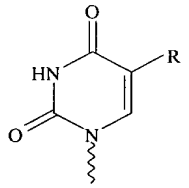
R_a is H, F, Cl, Br, I, or -C_1-C_4 alkyl, preferably H or CH_3;

Y is H, F, Cl, Br, I or -C_1-C_4 alkyl, preferably H or CH_3; and

n is 0, 1, 2,3, 4 or 5, preferably 0, 1 or 2;

and their anomers, pharmaceutically acceptable salts, solvates, or polymorphs thereof.

2. The compound according to claim 1 of formula II or IV wherein B is



3. The compound according to claim 2 of formula IV wherein

R^3 is an ethynyl group;

R is a C_1-C_3 alkyl group;

R^{3a} and R^{3b} are both H; and

R^2 is H, an acyl group, a phosphate, diphosphate, triphosphate or phosphodiester group.

4. The compound according to claim 3 wherein R is a CH_3 group.

5. The compound according to claim 4 wherein R^2 is H or an acyl group.

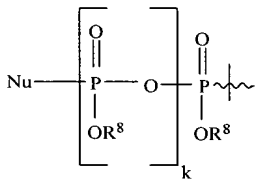
6. The compound according to claim 2 of formula II or IV

wherein R^3 is an ethynyl group or a $-CH_2-CH=CH_2$ group;

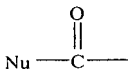
R is a C_1-C_3 alkyl group;

R^{3a} and R^{3b} are both H; and

R^2 is



or



group;

Nu is a radical of an anti-HIV nucleoside selected from the group consisting of 3TC, BLFd4C, FTC, BLFddC, AZT, d4T, ddI, ddC, abacavir and ddA, wherein a 5' hydroxyl group from said anti-HIV nucleoside forms a phosphate or carbonate linker;
R^8 is H or a C_1-C_{20} alkyl or ether group; and
k is 0 to 2.

7. The compound according to claim 6 wherein R is CH_3.

8. The compound according to claim 6 of formula IV
wherein R^3 is an ethynyl group;
R is a CH_3 group; and
R^{3a} and R^{3b} are both H.

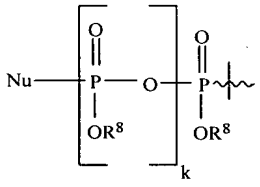
9. The compound according to claim 8 wherein Z is O.

10. The compound according to claim 8 wherein Z is CH_2.

11. The compound according to claim 9 wherein R^2 is H.

12. The compound according to claim 10 wherein R^2 is H.

13. The compound according to claim 8 wherein
R^2 is a



group;

R^8 is H or a C_1-C_{20} alkyl or ether group; and
k is 0 to 2.

14. The compound according to claim 13 wherein R^8 is H or a C_1-C_{12} alkyl group and k is 0.

15. The compound according to claim 14 wherein R^8 is H.

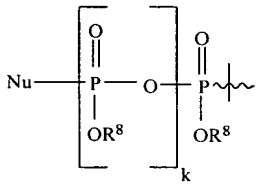
16. The compound according to claim 6 of formula II wherein R^3 is a $-CH_2-CH=CH_2$ group.

17. The compound according to claim 16 wherein Z is O.

18. The compound according to claim 16 wherein Z is CH_2.

19. The compound according to claim 17 wherein R^2 is H.

20. The compound according to claim 17 wherein
R^2 is a



group;

R^8 is H or a C_1-C_{20} alkyl or ether group; and
k is 0 to 2.

21. The compound according to claim 21 wherein R^8 is H or a C_1-C_{12} alkyl group and k is 0.

22. A pharmaceutical composition comprising an effective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier, additive or excipient.

23. A pharmaceutical composition comprising an effective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier, additive or excipient and at least one additional anti-HIV agent.

24. The composition according to claim 23 wherein said anti-HIV agent is selected from the group consisting of ddC, abacavir, ddI, ddA, 3TC, AZT, D4T, FTC, FddC, Fd4C, Atazanavir, Adefovir dipivoxyl, Tenofovir disoproxil, Etecavir, Indinavir, KHI-227. 2-[3-[3-(S)-[[(Tetrahydrofuranyloxy)carbonyl]amino]-4-phenyl-2(R)-hydroxybutyl]]-N-(1,1-dimethylethyl)decahydro-3-isoquinolinecarboxamide, VB-11,328, KNI-174,

Val-Val-Sta, CPG53820, bis-Val HOEt-N2 aza-peptide isostere, C2-Sym Phosphinic amide derivative, 2,5-Diamino-N,N'-bis(N-benzyloxycarbonyluelyl)-1,6-diphenyl-3(S),4(S)-hexanediol BzOCValPhe[diCHOH(SS]PheValBzOC,
2,5,-Diamino-N,N'-bis(N-benzyloxycarbonyluelyl)-1,6-diphenyl-3(R),4(R)-hexanediol BzOCValPhe[diCHOH(RR]PheValBzOC, [bis(SATE)ddAMP], BILA 2186 BS, Agenerase, A-98881, A-83962, A-80987, (2-Naphthalcarbonyl)Asn[decarbonylPhe-hydroxyethyl]ProOtertButyl , 2-Aminobenzylstatine Valyl Cbz derivative,
10H-2(Cbz-ValNH)3PhPr [14]paracyclophane derivative,
10H-2(Cbz-ValNH)3PhPr [13]paracyclophane derivative,
10H-2(Cbz-ValNH)3PhPr [13]metacyclophane derivative,
10H-2(Cbz-Tle)3PhPr [14]paracyclophane derivative,
1-(20HPr)-4-substituted-piperazine (cyclopropyl), thieneyl carbamate derivative,
1-(20HPr)-4-substituted-piperazine (cyclobutyl), thienyl carbamate derivative,
1-(20HPr)-4-substituted-piperazine (3-pentyl), thienyl carbamate derivative,
10H-2(Cbz-ValNH)3PhPr[17]paracyclophane derivative,
A-81525, XM323, Tipranavir , ThienopyridCON thienyl urethane derivatives,
SDZ PRI 053, SD146, Telinavir, (R)2QuinCOAsnPhe[CHOHCH2]PipCONHtBu, Saquinavir Saquinavir/Melfinavir derivative, IsoquinCON Thf-Thf Urethane Analog , IsoquinCON thienyl urethane analog, R-87366, DMP 460, L685,434, L685,434-6-Hydroxyl derivative, L685,434-OEtNMe2 , L685,434-OPrMorph derivative , L689,502 , Lasinavir , Aluviran , Nelfinavir-octahydro-thienopyridine analog, P9941, Palinavir,
And Penicillin, 2Isoquin-OHPrNH2 analog.

25. The composition according to claim 23 wherein said anti-HIV agent is selected from the group consisting of ddC, abacavir, ddI, ddA, 3TC, AZT, D4T, FTC, FddC and Fd4C.

26. A method of treating a viral infection in a patient in need thereof comprising administering to said patient an effective amount of a compound according to claim 1 in a pharmaceutically acceptable additive, carrier or excipient.

27. The method according to claim 3 wherein said viral infection is caused by a virus selected from the group consisting of human immunodeficiency viruses 1 and 2 (HIV-1 and HIV-2), human T-cell leukemia viruses 1 and 2 (HTLV-1 and HTLV-2), respiratory syncytial virus (RSV), human papilloma virus (HPV), adenovirus, hepatitis B virus (HBV), hepatitis C virus (HCV), Epstein-Barr virus (EBV), varicella zoster virus (VZV), cytomegalovirus

(CMV), herpes simplex viruses 1 and 2 (HSV-1 and HSV-2), human herpes virus 8 (HHV-8, also known as Kaposi's sarcoma-associated virus) and flaviviruses, including Yellow Fever virus, Dengue virus, Japanese Encephalitis and West Nile viruses.

28. The method according to claim 26 wherein said virus is HIV 1 or 2.

29. The method according to claim 28 wherein said compound is coadministered with at least one anti-HIV agent.

30. The method according to claim 29 wherein said anti-HIV agent is selected from the group consisting of ddC, abacavir, ddI, ddA, 3TC, AZT, D4T, FTC, FddC, Fd4C, Atazanavir, Adefovir dipivoxyl, Tenofovir disoproxil, Etecavir, Indinavir, KHI-227. 2-[3-[3-(S)-[[(Tetrahydrofuranyloxy)carbonyl]amino]-4-phenyl-2(R)-hydroxybutyl]]-N-(1,1-dimethylethyl)decahydro-3-isoquinolinecarboxamide, VB-11,328, KNI-174, Val-Val-Sta, CPG53820, bis-Val HOEt-N2 aza-peptide isostere, C2-Sym Phosphinic amide derivative, 2,5-Diamino-N,N'-bis(N-benzyloxycarbonyluelyl)-1,6-diphenyl-3(S),4(S)-hexanediol BzOCValPhe[diCHOH(SS]PheValBzOC, 2,5,-Diamino-N,N'-bis(N-benzyloxycarbonyluelyl)-1,6-diphenyl-3(R),4(R)-hexanediol BzOCValPhe[diCHOH(RR]PheValBzOC, [bis(SATE)ddAMP], BILA 2186 BS, Agenerase, A-98881, A-83962, A-80987, (2-Naphthalcarbonyl)Asn[decarbonylPhe-hydroxyethyl]ProOtertButyl , 2-Aminobenzylstatine Valyl Cbz derivative, 10H-2(Cbz-ValNH)3PhPr [14]paracyclophane derivative, 10H-2(Cbz-ValNH)3PhPr [13]paracyclophane derivative, 10H-2(Cbz-ValNH)3PhPr [13]metacyclophane derivative, 10H-2(Cbz-Tle)3PhPr [14]paracyclophane derivative, 1-(20HPr)-4-substituted-piperazine (cyclopropyl), thieneyl carbamate derivative, 1-(20HPr)-4-substituted-piperazine (cyclobutyl), thienyl carbamate derivative, 1-(20HPr)-4-substituted-piperazine (3-pentyl), thienyl carbamate derivative, 10H-2(Cbz-ValNH)3PhPr[17]paracyclophane derivative, A-81525, XM323, Tipranavir , ThienopyridCON thienyl urethane derivatives, SDZ PRI 053, SD146, Telinavir, (R)2QuinCOAsnPhe[CHOHCH2]PipCONHtBu, Saquinavir Saquinavir/Melfinavir derivative, IsoquinCON Thf-Thf Urethane Analog , IsoquinCON thienyl urethane analog, R-87366, DMP 460, L685,434, L685,434-6-Hydroxyl derivative, L685,434-OEtNMe2 , L685,434-OPrMorph derivative , L689,502 , Lasinavir , Aluviran , Nelfinavir-octahydro-thienopyridine analog, P9941, Palinavir,

And Penicillin, 2Isoquin-OHPrNH2 analog.

31. The method according to claim 29 wherein said anti-HIV agent is selected from the group consisting of ddC, abacavir, ddI, ddA, 3TC, AZT, D4T, FTC, FddC and Fd4C.

32. A method of reducing the likelihood or delaying the onset of a viral infection in a patient at risk for infection, said method comprising administering to said patient an effective amount of a compound according to claim 1.

33. The method according to claim 32 wherein said virus is selected from the group consisting of human immunodeficiency viruses 1 and 2 (HIV-1 and HIV-2), human T-cell leukemia viruses 1 and 2 (HTLV-1 and HTLV-2), respiratory syncytial virus (RSV), human papilloma virus (HPV), adenovirus, hepatitis B virus (HBV), hepatitis C virus (HCV), Epstein-Barr virus (EBV), varicella zoster virus (VZV), cytomegalovirus (CMV), herpes simplex viruses 1 and 2 (HSV-1 and HSV-2), human herpes virus 8 (HHV-8, also known as Kaposi's sarcoma-associated virus) and flaviviruses, including Yellow Fever virus, Dengue virus, Japanese Encephalitis and West Nile viruses.

34. The method according to claim 34 wherein said virus is HIV 1 or 2.

35. The method according to claim 34 wherein said compound is coadministered with at least one anti-HIV agent.

36. The method according to claim 34 wherein said anti-HIV agent is selected from the group consisting of ddC, abacavir, ddI, ddA, 3TC, AZT, D4T, FTC, FddC, Fd4C, Atazanavir, Adefovir dipivoxyl, Tenofovir disoproxil, Etecavir, Indinavir, KHI-227. 2-[3-[3-(S)-[[(Tetrahydrofuranyloxy)carbonyl]amino]-4-phenyl-2(R)-hydroxybutyl]]-N-(1,1-dimethylethyl)decahydro-3-isoquinolinecarboxamide, VB-11,328, KNI-174, Val-Val-Sta, CPG53820, bis-Val HOEt-N2 aza-peptide isostere, C2-Sym Phosphinic amide derivative, 2,5-Diamino-N,N'-bis(N-benzyloxycarbonyluelyl)-1,6-diphenyl-3(S),4(S)-hexanediol BzOCValPhe[diCHOH(SS]PheValBzOC, 2,5,-Diamino-N,N'-bis(N-benzyloxycarbonyluelyl)-1,6-diphenyl-3(R),4(R)-hexanediol

BzOCValPhe[diCHOH(RR]PheValBzOC, [bis(SATE)ddAMP], BILA 2186 BS, Agenerase, A-98881, A-83962, A-80987, (2-Naphthalcarbonyl)Asn[decarbonylPhe-hydroxyethyl]ProOtertButyl , 2-Aminobenzylstatine Valyl Cbz derivative,
10H-2(Cbz-ValNH)3PhPr [14]paracyclophane derivative,
10H-2(Cbz-ValNH)3PhPr [13]paracyclophane derivative,
10H-2(Cbz-ValNH)3PhPr [13]metacyclophane derivative,
10H-2(Cbz-Tle)3PhPr [14]paracyclophane derivative,
1-(20HPr)-4-substituted-piperazine (cyclopropyl), thieneyl carbamate derivative,
1-(20HPr)-4-substituted-piperazine (cyclobutyl), thienyl carbamate derivative,
1-(20HPr)-4-substituted-piperazine (3-pentyl), thienyl carbamate derivative,
10H-2(Cbz-ValNH)3PhPr[17]paracyclophane derivative,
A-81525, XM323, Tipranavir , ThienopyridCON thienyl urethane derivatives,
SDZ PRI 053, SD146, Telinavir, (R)2QuinCOAsnPhe[CHOHCH2]PipCONHtBu, Saquinavir Saquinavir/Melfinavir derivative, IsoquinCON Thf-Thf Urethane Analog , IsoquinCON thienyl urethane analog, R-87366, DMP 460, L685,434, L685,434-6-Hydroxyl derivative, L685,434-OEtNMe2 , L685,434-OPrMorph derivative , L689,502 , Lasinavir , Aluviran , Nelfinavir-octahydro-thienopyridine analog, P9941, Palinavir,
And Penicillin, 2Isoquin-OHPrNH2 analog.

37. The method according to claim 35 wherein said anti-HIV agent is selected from the group consisting of ddC, abacavir, ddI, ddA, 3TC, AZT, D4T, FTC, FddC and Fd4C.

38. A method of preventing, reducing the likelihood or delaying the onset of a condition secondary to a virus infection in a patient at risk for the development of said condition, said method comprising administering to said patient an effective amount of a compound according to claim 1 to said patient.

39. The method according to claim 8 wherein said condition is AIDS.

40. A method of treating a patient in need thereof for an HIV infection with combination therapy, said method comprising administering to said patient an effective amount of a combination of at least compound according to claim 1 in combination with at least one compound selected from the group consisting of nucleoside reverse transcriptase inhibitors

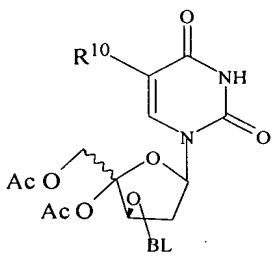
(NRTI), non-nucloeoside reverse transcriptase inhibitors, protease inhibitors, fusion inhibitors and mixtures thereof.

41. A method of treating a patient in need thereof for an HIV infection with combination therapy, said method comprising administering to said patient an effective amount of a combination of at least compound according to claim 1 with at least one compound selected from the group consisting of 3TC (Lamivudine), AZT (Zidovudine), (-)-FTC, ddI (Didanosine), ddC (zalcitabine), abacavir (ABC), tenofovir (PMPA), D-D4FC (Reverset), D4T (Stavudine), Racivir, L-FddC, L-D4FC, NVP (Nevirapine), DLV (Delavirdine), EFV (Efavirenz), SQVM (Saquinavir mesylate), RTV (Ritonavir), IDV (Indinavir), SQV (Saquinavir), NFV (Nelfinavir), APV (Amprenavir), LPV (Lopinavir), T20, fuseon and mixtures thereof.

42. Use of a compound according to claim 1 in the manufacture of a medicament for the treatment of an infection having as its causative agent a virus.

43. Use according to claim 42 wherein said virus is selected from the group consisting of human immunodeficiency viruses 1 and 2 (HIV-1 and HIV-2), human T-cell leukemia viruses 1 and 2 (HTLV-1 and HTLV-2), respiratory syncytial virus (RSV), human papilloma virus (HPV), adenovirus, hepatitis B virus (HBV), hepatitis C virus (HCV), Epstein-Barr virus (EBV), varicella zoster virus (VZV), cytomegalovirus (CMV), herpes simplex viruses 1 and 2 (HSV-1 and HSV-2), human herpes virus 8 (HHV-8, also known as Kaposi's sarcoma-associated virus) and flaviviruses, including Yellow Fever virus, Dengue virus, Japanese Encephalitis and West Nile viruses.

44. A method of chemically synthesizing a compound according to the chemical structure:

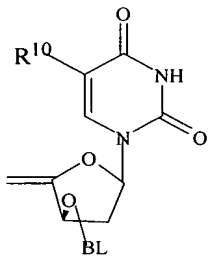


where R^{10} is H or a C_1-C_4 alkyl group;

Ac is a benzoyl or acetyl group group; and

BL is a trialkylsilyl blocking group;

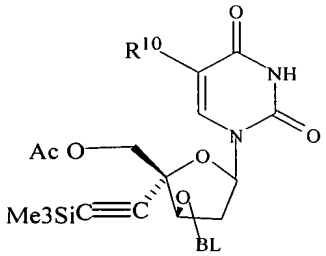
comprising reacting a compound according to the structure:



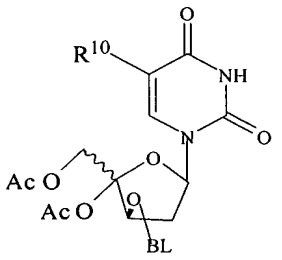
with tetracetate lead or lead benzoate in the presence of solvent and an amine base.

45. The method according to claim 44 wherein BL is a tert-butyldimethylsilyl group, Ac is a benzoyl group, and R^{10} is a methyl group and lead benzoate is used in the presence of toluene and diisopropylethylamine.

46. A method of synthesizing a compound according to the chemical structure:



comprising reacting a compound according to the structure:



where R^{10} is H or a C1-C4 alkyl group;

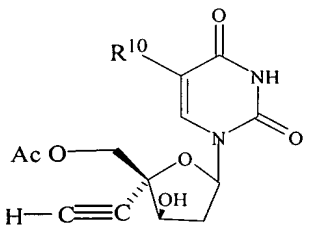
Ac is an acetyl or benzoyl group; and

BL is a trialkylsilyl blocking group;

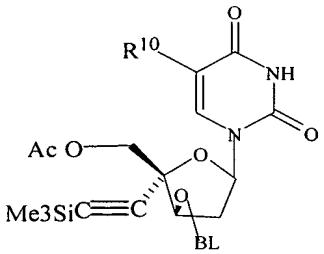
with AlkylAl(Cl)-C≡CSiMe$_3$ where alkyl is a C_1-C_3 alkyl group in solvent.

47. The method according to claim 46 wherein R10 is a methyl group, Ac is a benzoyl group and BL is a tert.-butyldimethyl group.

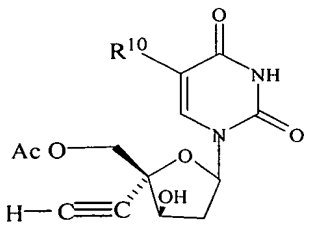
48. A method of producing a compound according to the chemical structure



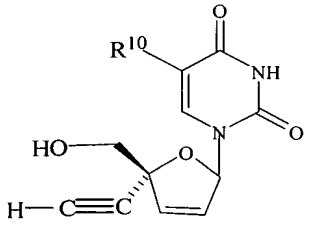
where R^{10} is H or a C_1-C_4 alkyl group, comprising selectively deblocking the silicone blocking groups in a compound according to the chemical structure:



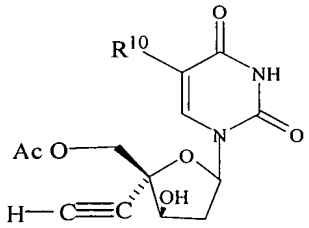
to produce a compound according to the chemical structure:



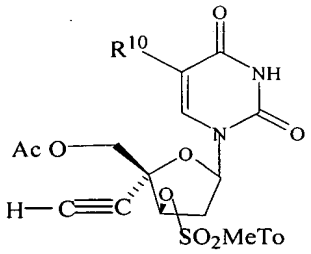
48. A method of producing a compound according to the chemical structure:



where R^{10} is H or a C_1-C_4 alkyl group comprising reacting a compound according to the chemical structure:



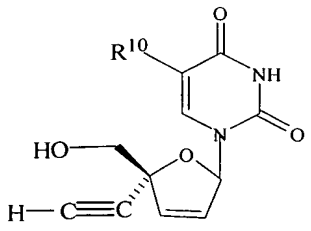
with methane sulfonyl chloride or toluenesulfonyl chloride to produce intermediate M:



Intermediate M

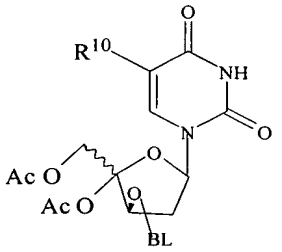
where MeTo is a methyl group or a toluene group; and

subjecting intermediate M to DBN in acetonitrile followed by removal of the Ac group to produce the compound

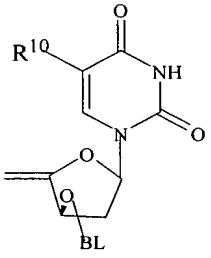


49. The method according to claim 48 wherein R10 is methyl and MeTo is a methyl group.

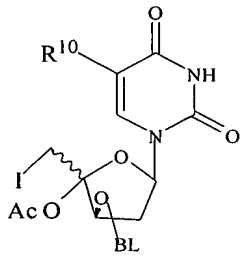
50. A method of synthesizing a compound according to the chemical structure:



where R^{10} is H or a C_1-C_4 alkyl group, Ac is a benzoyl or acetyl group and BL is a trialkysilyl blocking group, comprising reacting a compound according to the chemical structure:

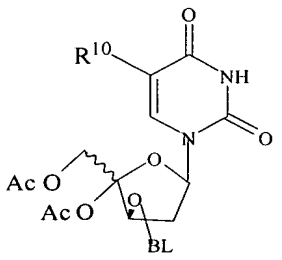


with silver benzoate or silver acetate in the presence of iodine in solvent to produce



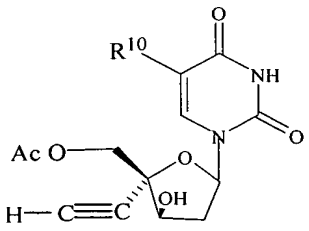
Intermediate IAc

and then reacting said intermediate Iac with silver benzoate or silver acetate in a solvent at elevated temperature to produce



51. The method according to claim 50 wherein Ac is a benzoate group, R^{10} is methyl and BL is a tert.-butyldimethylsilyl group, said solvent is xylene and said elevated temperature is about 150°C.

52. The compound:



where R^{10} is H or a C_1-C_4 alkyl group and Ac is an acetyl or benzoyl group.

53. The compound according to claim 52 where R^{10} is CH_3 and Ac is a benzoyl group.